

# Drėgmės režimo dirvožemyje reguliavimas

**1. Keywords:** Controlled drainage, Smart drainage, Runoff control, Drainage system, Soil drainage

**2. Area:** Water management

**3. Subarea:** Development of technologies of regulated drainage systems

**4. Theme:** Control of soil moisture regime

**5. Year:** 2019

**6. Summary:** The aim of the project is to evaluate soil moisture control measures and their effectiveness in the territory of Lithuania, their economic and ecological benefits in order to increase agricultural competitiveness and encourage farmers to implement innovative research-based technologies that ensure sustainable use of water resources and environmental protection. Practical problems are solved: unfavorable soil moisture regime and sub-optimal provision of moisture reserves for plants during dry periods; agricultural losses due to excess or scarcity of moisture, less efficient use of nutrients (NPK), and pollution of surface water bodies. Controlled drainage has an environmental impact: the resulting hydraulic head in controlled systems reduced NO<sub>3</sub>-N and NH<sub>4</sub>-N concentrations in drainage water by 71 and 100%, and phosphorus, Pb PO<sub>4</sub>-P and Nb contents in controlled systems are lower by 29, 43 and 43%. At 40 cm, the moisture reserves are 5.1–6.9%, at 60 cm - 21%, and at 1 m - 3.1% larger.

**7. More detailed version of the summary:** The innovation assessed the measures of soil moisture regime control, the effectiveness of their application in the territory of Lithuania and the economic and ecological benefits provided in order to increase the competitiveness of agriculture and encourage farmers to implement innovative research-based technologies that ensure sustainable use of natural water resources and environmental protection. The innovation of controlled drainage drainage systems included the following activities (the most relevant are listed): 1. Technical preparation of innovations for implementation processes, involving members of the EIP Action Groups in solving problems relevant to farmers. 2. Providing farmers with special knowledge so that they are willing to implement soil moisture control (controlled drainage) systems on their farms. 3. Research-based and practical actions to optimize the use of nutrients by reducing their input to surface water bodies and ensuring the sustainable management of natural resources. The application of the innovation ensured a favorable soil moisture regime and optimal moisture reserves for plants during arid periods, thus reducing agricultural losses due to excess or scarcity of moisture, as well as more efficient use of nutrients (NPK) and reduced pollution of surface water bodies. Farmers participating in the project reduced their costs due to reduced yields in the event of a moisture deficit, as did the costs of irrigation. By installing controlled drainage runoff systems and controlling drainage runoff, optimal soil moisture conditions during plant growing season and tillage periods were ensured, and higher crop yields were obtained. The soil moisture control system was implemented and tested on 6 farms in different districts of the country, assessing the agro-climate, farming activity, soil texture, relief, existing drainage systems and other conditions. Recommendations for the implementation, development and improvement of drainage runoff control technologies have been prepared.

**8. Effect:** Agro-environmental protection, Economical, Sustainable Farming

**9. Argumentation:** The resulting hydraulic head reduced NO<sub>3</sub>-N and NH<sub>4</sub>-N concentrations in drainage water by 71 and 100%, total phosphorus (P) and PO<sub>4</sub>-P and total nitrogen (N) by 29.43 and 43%, respectively. Nutrient leaching was reduced by 16-94%. Annually, the yield per ha increased in €: winter wheat - 433, barley - 237, peas - 115, beans - 416. At a soil depth of 40 cm, moisture reserves increased by 5.1–6.9%, at 60 cm - 21%.

**10. Project description:** -

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**12. URL:** <https://bit.ly/2YtiZbm>

**13. Images:**

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**14. YouTube:** <https://www.youtube.com/watch?v=rmOaWfgPXCE>

**15. Documents:** [General recommendations for introduction of controlled drainage innovation\\_EN.pdf](#)